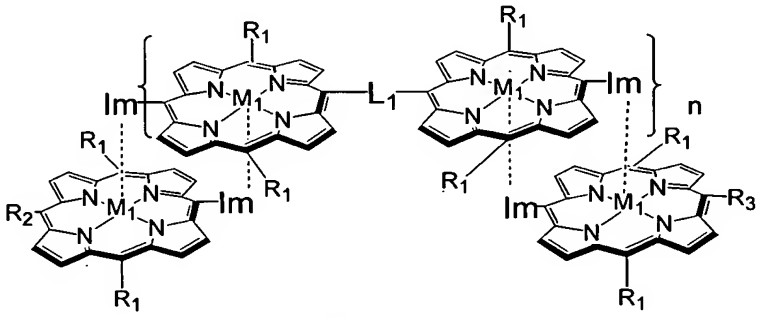
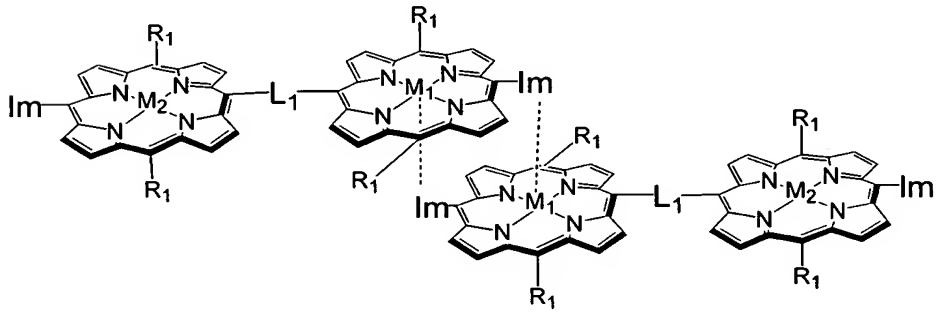
WHAT IS CLAIMED IS:

1. A porphyrin array exhibiting a large two-photon absorption property, and being linked with an acetylenic bond(s), represented by formula (1-1) or (1-2):



(1-1)



(1-2)

wherein

R_1 represents a substituted or unsubstituted alkyl group or substituted or unsubstituted aryl group;

M_1 represents a metal ion capable of serving as a core metal of the porphyrin ring and forming a coordinate bond with the imidazolyl group represented by Im;

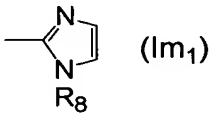
M_2 represents either two protons or a metal ion incapable of forming a coordinate bond with the imidazolyl group represented by Im;

R_2 and R_3 may be the same or different, and each

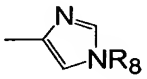
independently represent a group selected from the group consisting of (a) to (f):

(a) a porphyrin residue without a core metal or porphyrin complex residue having a core metal represented by M_1 or M_2, (b) a cyclic diimide residue, (c) a dialkylviologen residue, (d) a benzoquinone residue, (e) an N-methylpyrrolidine-fullerene derivative residue and (f) a ferrocene residue;

Im is an imidazolyl group represented by Im_1 or Im_2:



(Im_1)



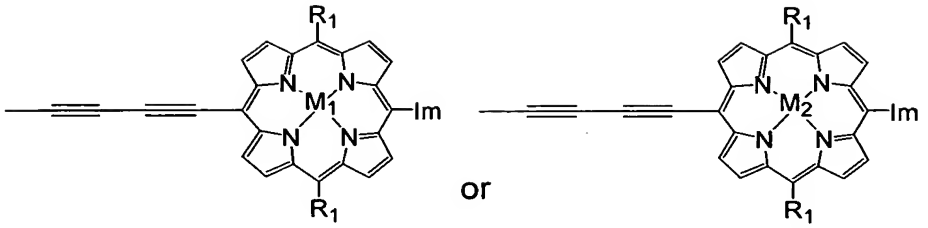
(Im_2)

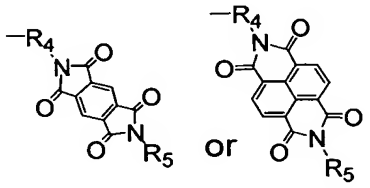
(wherein R_8 represents a methyl group or hydrogen atom);

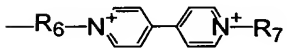
L_1 represents a linking group represented by $(-C\equiv C-)_m$ (wherein m represents an integer of 1 to 3); and

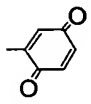
n represents an integer of 1 or more.

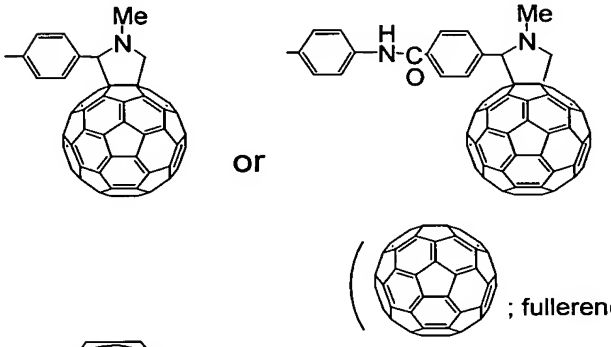
2. The porphyrin array according to claim 1, wherein the respective residues (a), (b), (c), (d), (e) and (f) are represented by:

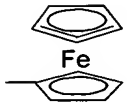
(a) 

(b) 

(c) 

(d) 

(e) 

(f) 

wherein

R_1, M_1, M_2 and Im have the same meaning as defined in claim 1;

R_4 and R_6 each independently represent an alkylene group or arylene group; and

R_5 and R_7 each independently represent an alkyl group, alkoxyalkyl group, alkoxycarbonyl group or aryl

group.

3. The porphyrin array according to claim 1, wherein M_1 is an ion of metal selected from the group consisting of zinc, iron, cobalt, ruthenium and gallium.

4. The porphyrin array according to claim 1, wherein the substituted alkyl group represented by R_1 is selected from the group consisting of an alkoxycarbonylalkyl group, alkoxyalkyl group, alkenoxyalkyl group and alkenoxycarbonylalkyl group; and the substituted aryl group represented by R_1 is selected from the group consisting of an alkylaryl group, alkoxyaryl group, alkoxycarbonylaryl group, alkenoxyaryl group and alkenoxycarbonylaryl group.

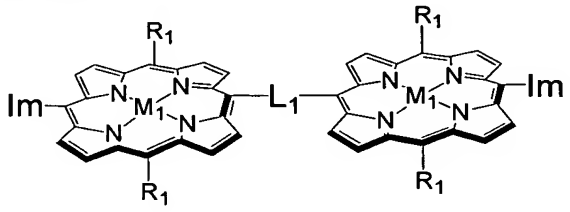
5. The porphyrin array according to claim 1, wherein the number of carbon atoms of the substituted or unsubstituted alkyl group represented by R_1 is 1 to 24; and the number of carbon atoms of the substituted or unsubstituted aryl group represented by R_1 is 6 to 24.

6. The porphyrin array according to claim 1, wherein the number of carbon atoms of the alkyl group or the alkylene group represented by R_4 to R_7 is independently selected from 1 to 20; the number of carbon atoms of the alkoxyalkyl group or the alkoxycarbonyl group represented by R_5 and R_7 is independently selected from 2 to 21; and the number of carbon atoms of the aryl group or the arylene group

represented by R_4 to R_7 is independently selected from 6 to 20.

7. A method of preparing the porphyrin array represented by the formula (1-1) or (1-2) according to claim 1 comprising:

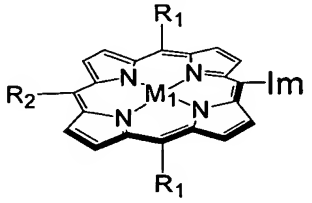
reacting, in the presence of a polar solvent, an imidazolylporphyrin metal complex represented by the following formula (2),



(2)

wherein R_1, M_1, L_1 and Im have the same meaning as defined in claim 1

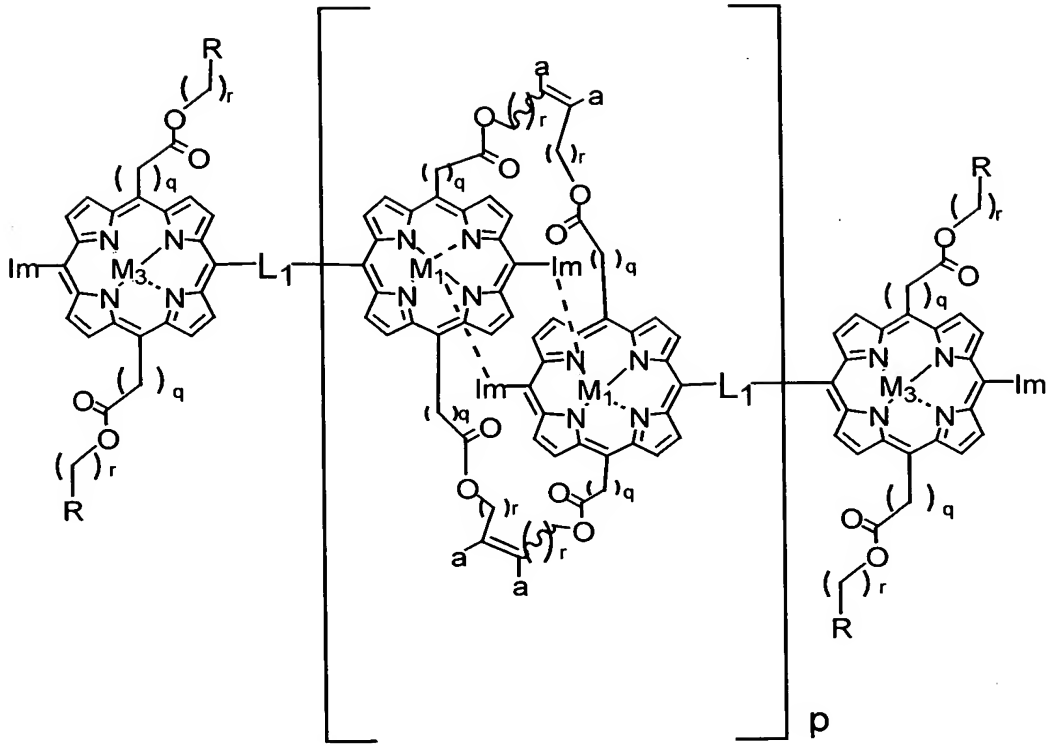
with an imidazolylporphyrin metal complex represented by the following formula (3),



(3)

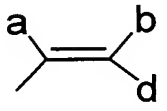
wherein R_1, R_2, M_1 and Im have the same meaning as defined in claim 1.

8. A porphyrin array exhibiting a large two-photon absorption property, and being fixed with a covalent bond(s), represented by formula (4):



(4)

wherein R represents an alkyl group or a group as shown below:



(wherein a, b and c independently represent H, an alkyl group or aryl group);

M_1, L_1 and Im have the same meaning as defined in claim 1; M_3 represents either two protons or a metal ion selected from the group consisting of those represented by M_1 and M_2; p represents an integer of 1 or more; q represents an integer of 0 to 6; and r represents an integer of 0 to 4.